Parcel C RU-C5 Fieldwork Update

Groundwater Treatability Study

BCT Meeting
Feb 24, 2011

RU-C5 Groundwater Treatability Study (TS) Overview

1. Pre-Design Characterization/Baseline Sampling

2. Treatment Component (TC) TS Design Finalization

3. TC 1 and 3, Implementation of Hydraulic Fracturing and EHC Emplacement in Source Area and Plume

4. **TC2: Thermal Conduction Heating**

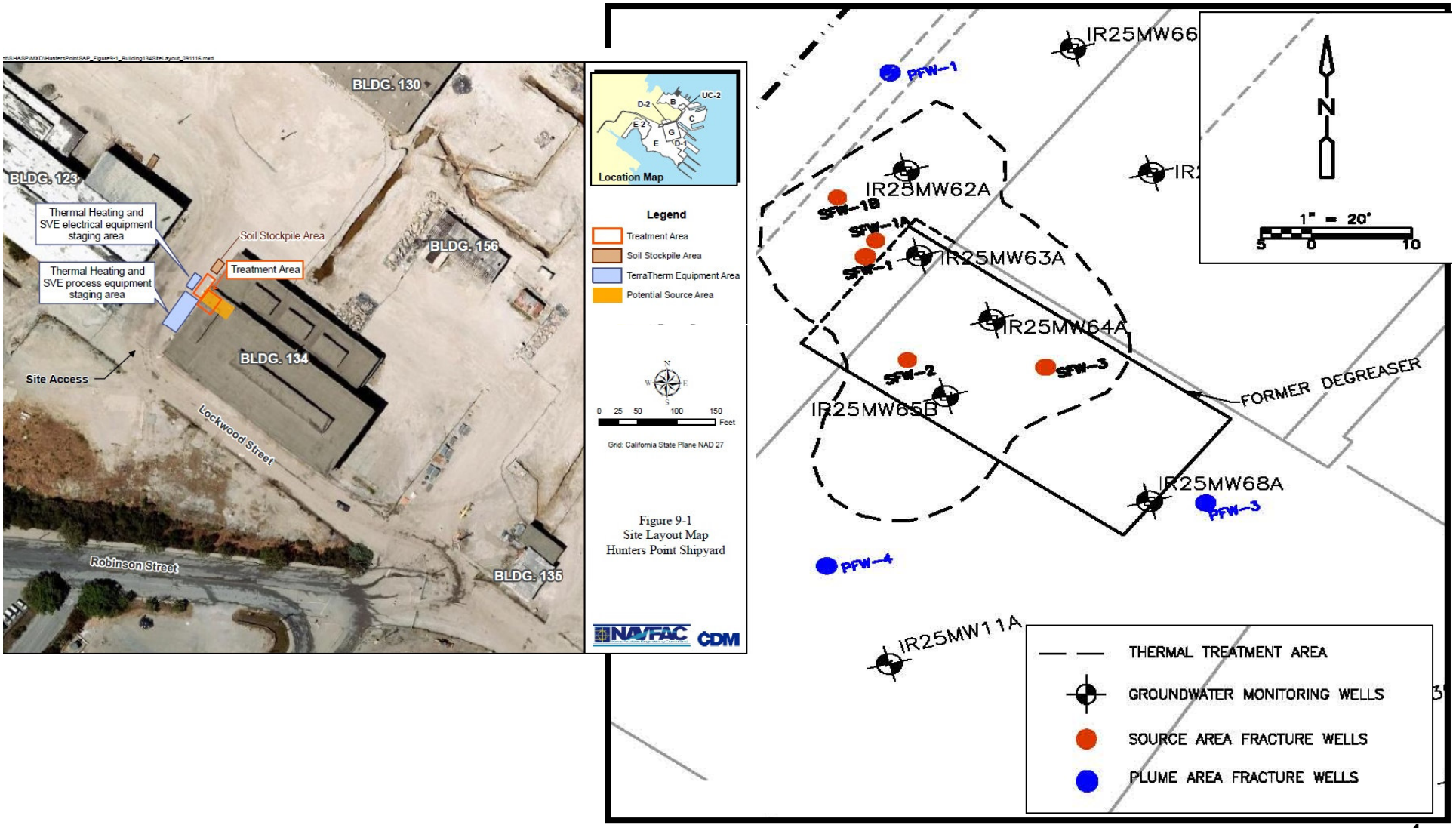
5. **TC3: Polish**

Presentation Roadmap

1. **TC 3: Hydraulic fracturing and EHC emplacement in dissolved phase plume.**
   - **Focus on Plume wells (IR25MW11A and -68A)- address accumulated 1,4-dichlorobenzene and chlorobenzene.**
   - **Design for polish**

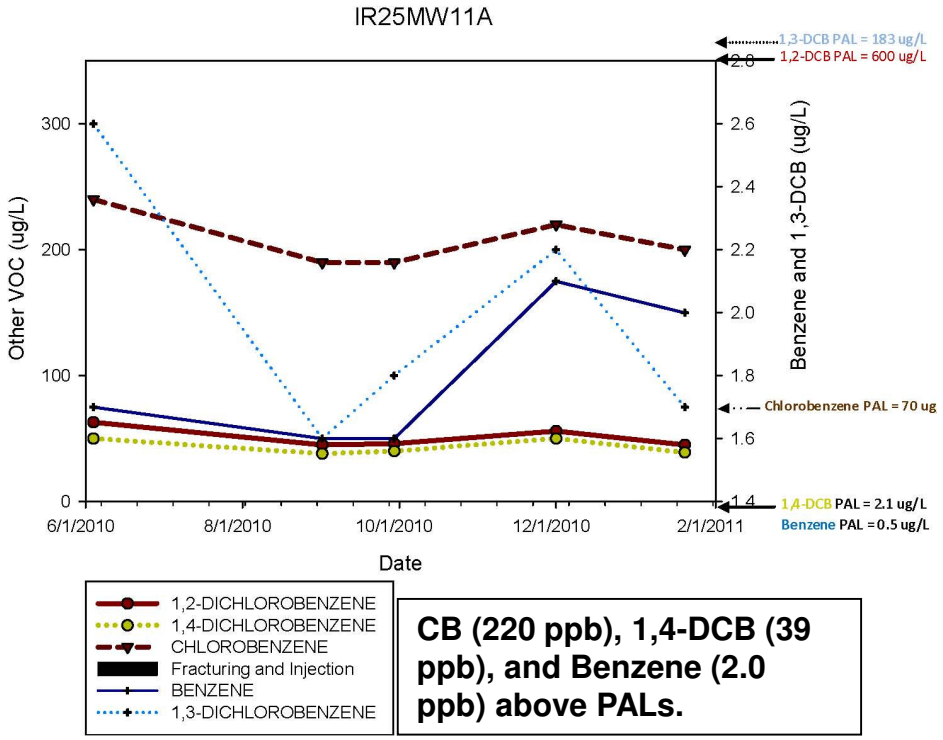
2. TC2: Thermal conduction heating in the source area
   - Review website
   - Details of performance evaluation
   - Shutdown criteria

RU-C5 Building 134 TS Area

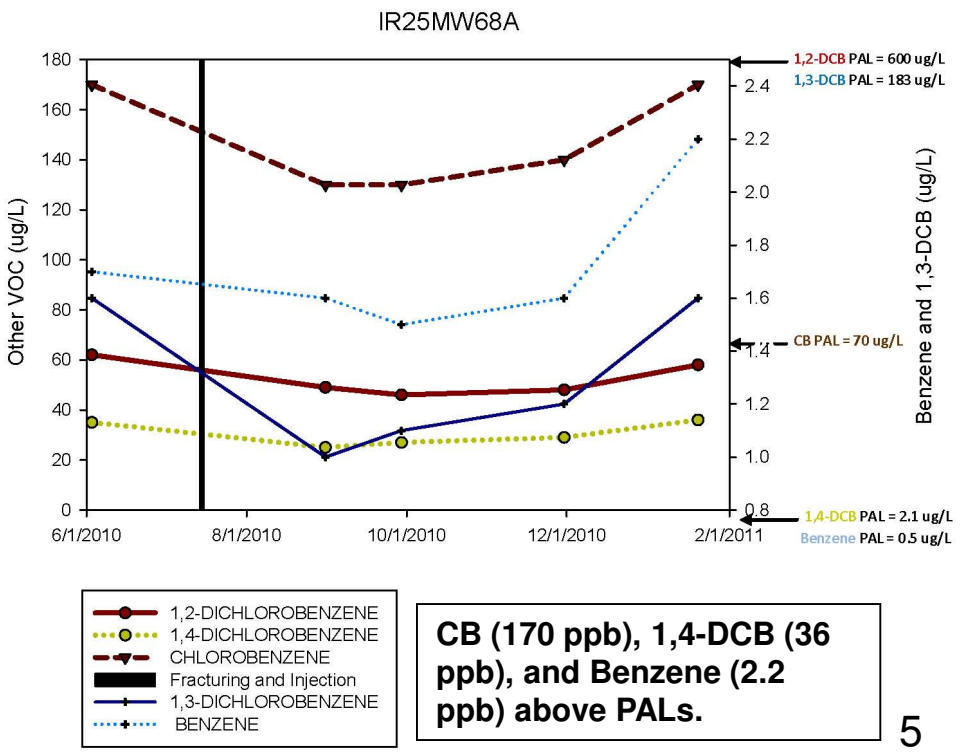


Rational for Carbon Injection

- **Polish for dissolved plume near IR25MW11A and IR25MW68A that did not meet the sulfate polish criteria.**
- **Carbon (LactOil) injection to increase degradation rates of 1,4-DCB and chlorobenzene.**



CB (220 ppb), 1,4-DCB (39 ppb), and Benzene (2.0 ppb) above PALs.



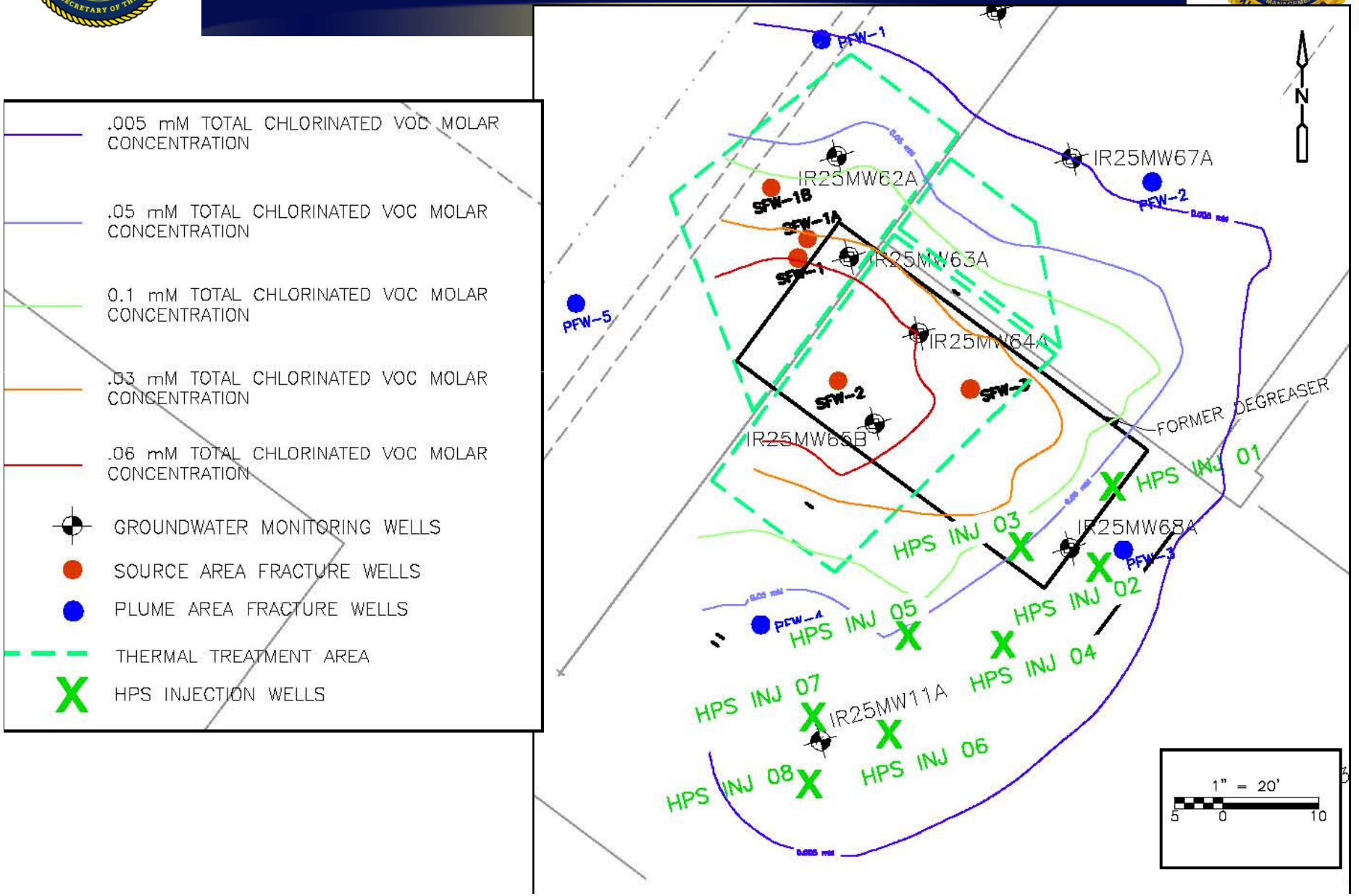
CB (170 ppb), 1,4-DCB (36 ppb), and Benzene (2.2 ppb) above PALs.

TC3: Injection Design Parameters

1. **Use LactOil- combination of lactate (35%) and a microemusified vegetable oil (45%).**
2. **Based on CDM and the Shaw Treatability Tests, target in situ concentration ~1000 mg/L carbon.**

Design Injection Parameters	
Target ROI	5 ft
Target Depth Interval- A aquifer	18-21 ft bgs (~ to bay mud)
Injection Concentration	2% v/v, or 16 g LactOil/L
Flow Rate	0.5 gpm
Effective Porosity (assumed)	0.15
Volume per Well	881 gallons
Total Volume	7048 gallons
Injection Time	29 hours

TC1&3: Polish at IR25MW11A and IR25MW68A



SAP Addendum

Change to Original SAP	Corresponding Section(s)/Worksheet(s)
Navy Remedial Project Manager (RPM) changed from Sarah Koppel to Hamide Kayaci and CDM QA Coordinator (QAC) changed from Matt Brookshire to Randa Chichakli.	Worksheet #3, Distribution List: • Navy RPM; and • CDM QAC. Worksheet #5, Project Organizational Chart. Worksheet #6, Communication Pathways: Worksheet #7, Personnel Responsibilities and Qualifications Table:
Soil vapor samples collected from vapor extraction wells will be analyzed for ethane, ethene, methane, and acetylene using American Standard for Testing and Materials (ASTM) method D1946Mod. The results will be used as screening data to calculate photo ionization detector (PID) correction factors and used in the estimation of mass removal rates for Treatment Component (TC) 2.	Worksheet #11, Data Quality Objectives (DQOs)/Systematic Planning Process Statements: Tables 1 and 2. Worksheet #12-3, Measurement Performance Criteria Table for Soil Vapor Samples. Worksheet #15-19, Reference Limits and Evaluation Table *(new worksheet added)*. Worksheet #18-#23, Sampling Locations and Methods/SOP Requirements Table: Soil vapor matrix. Worksheet #24, Analytical Instrument Calibration Table: GC/FID/TCD instrument Worksheet #25, Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table:GC instrument Worksheet #28-13, Laboratory QC Samples Table for Fixed Gases *(new worksheet added)*.

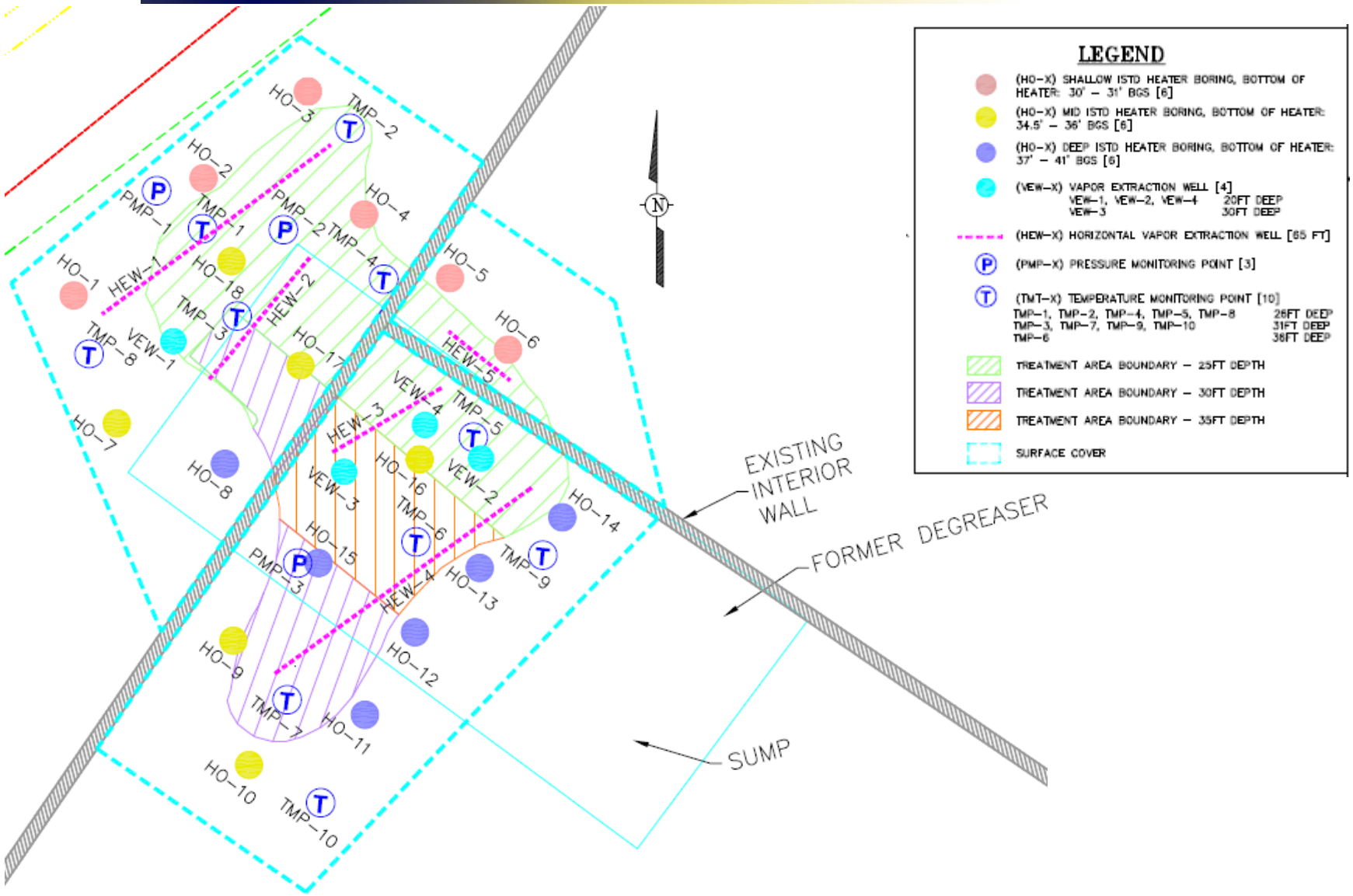
SAP Addendum

Change to Original SAP	Corresponding Section(s)/Worksheet(s)
The original SAP assumed sulfate would be injected as a polishing agent to reduce benzene concentrations if necessary for TC3. The decision condition to inject sulfate was to be made if: 1) benzene was present, 2) parent compounds were below Project Action Limits (PALs), and 3) reductive daughter products were above PALs. After 4 rounds of groundwater performance monitoring at TC3, the following conditions have been observed: 1) benzene is present, 2) parent compound 1,4-dichlorobenzene and chlorobenzene concentrations are above PALs, and 3) reductive daughter products are above PALs. Injecting carbon in these conditions will be more effective that injecting sulfate so that the 1,4-dichlorobenzene and chlorobenzene (parent compounds) concentrations can be reduced. Sulfate has been measured in the system; therefore it is not anticipated that sulfate injections will be necessary for TC3.	Worksheet #11, Data Quality Objectives (DQOs)/Systematic Planning Process Statements: • Project Decision Conditions, #2, last bullet; and • Table 2, Step 5 (#2, last bullet). Worksheet #14, Summary of Project Tasks: • Implementation of TCs. Worksheet #17, Sampling Design and Rationale: • TC 3: Treatment of the Dissolved Phase Plume.
Extension of project schedule.	Worksheet #16, Project Schedule/Timeline Table.

Presentation Roadmap

1. TC2: Thermal conduction heating in the source area
   - Review website
   - Details of O&M and Performance Evaluation.

TC2: TCH Treatment System As-Built



TC2: Website

The login for the website www.thinkthermal.com:

Under the TerraTherm box inputs:

Select “Hunters Point” from the "Site" dropdown menu

Username: RUC5TS

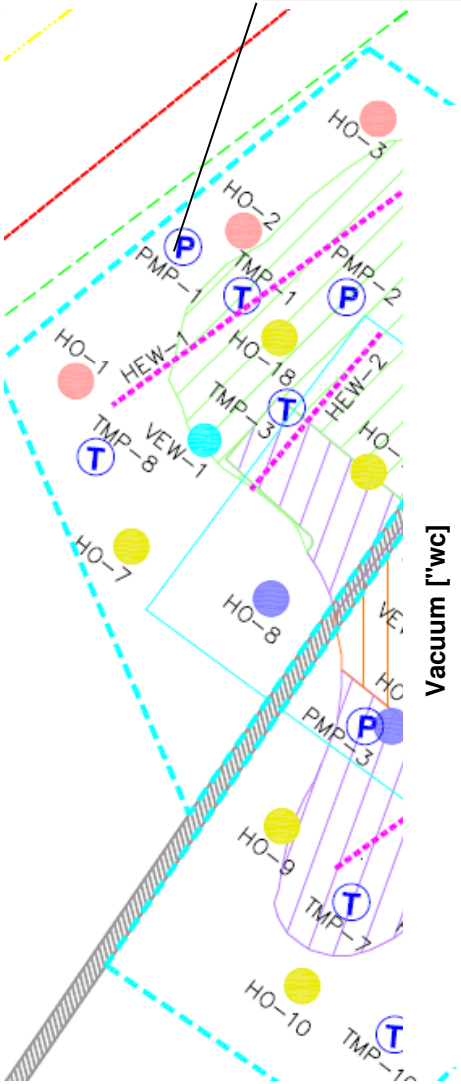
Password (case sensitive): blg134

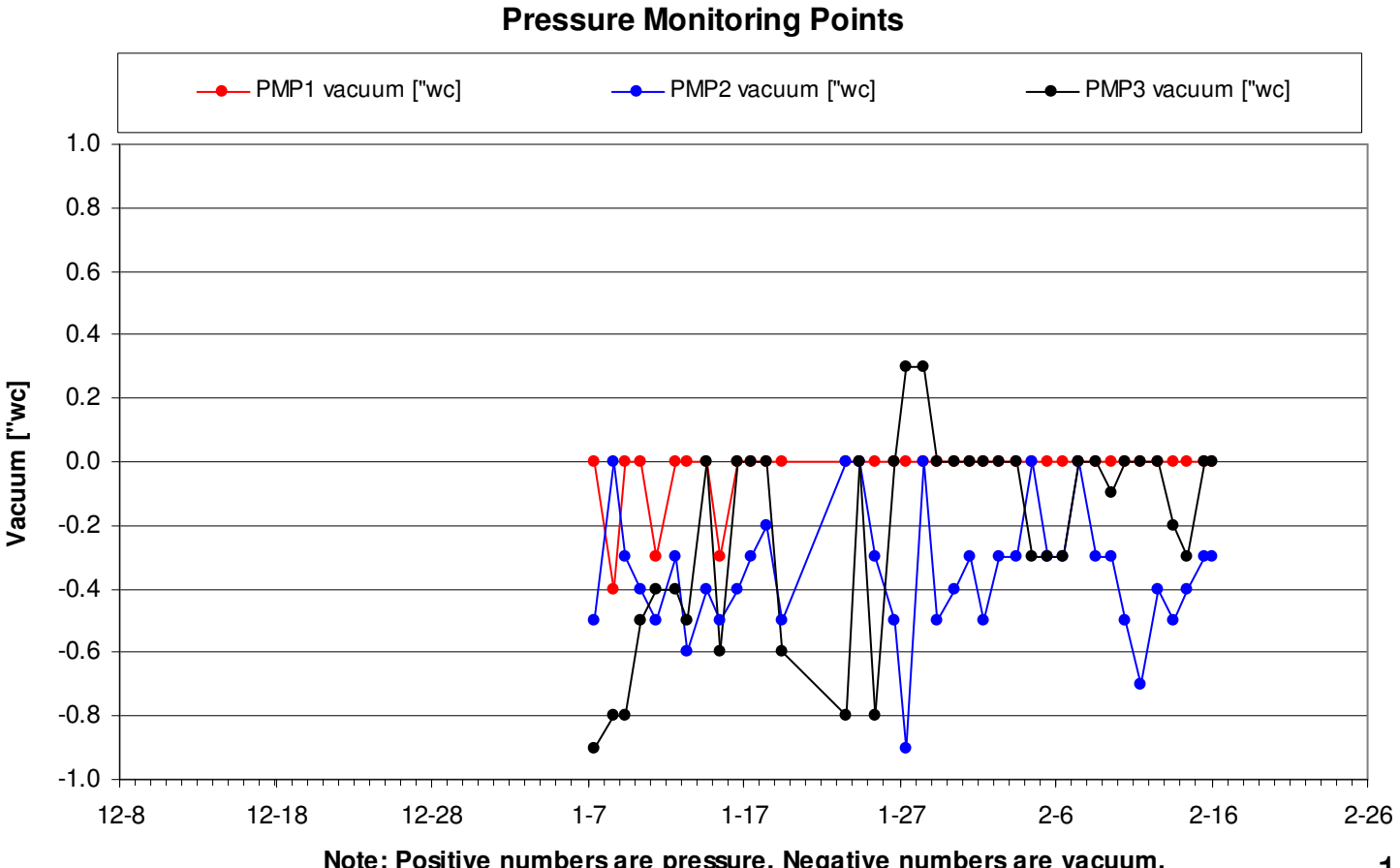
- Updated twice/week (usually Monday and Thursday) with O&M process monitoring data.

TC2: Pneumatic Control

PMP well moved outside the treatment zone on the treatment side of the swale

- **Move PMP to outside of the treatment boundary to monitor soil gas COC concentrations before and ~1/month during thermal treatment.**



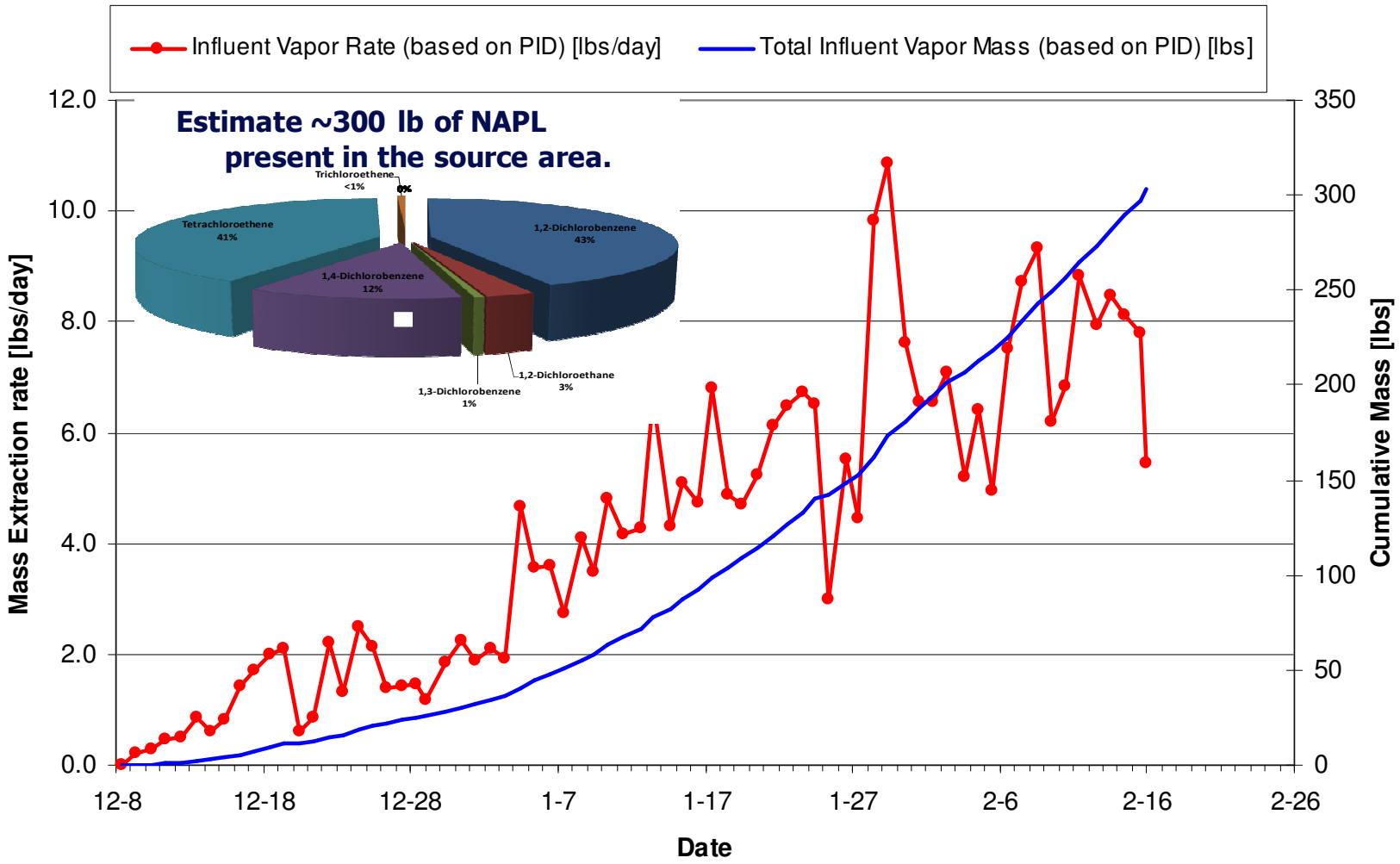


Note: Positive numbers are pressure. Negative numbers are vacuum.

Current Progress at Building 134

TWM

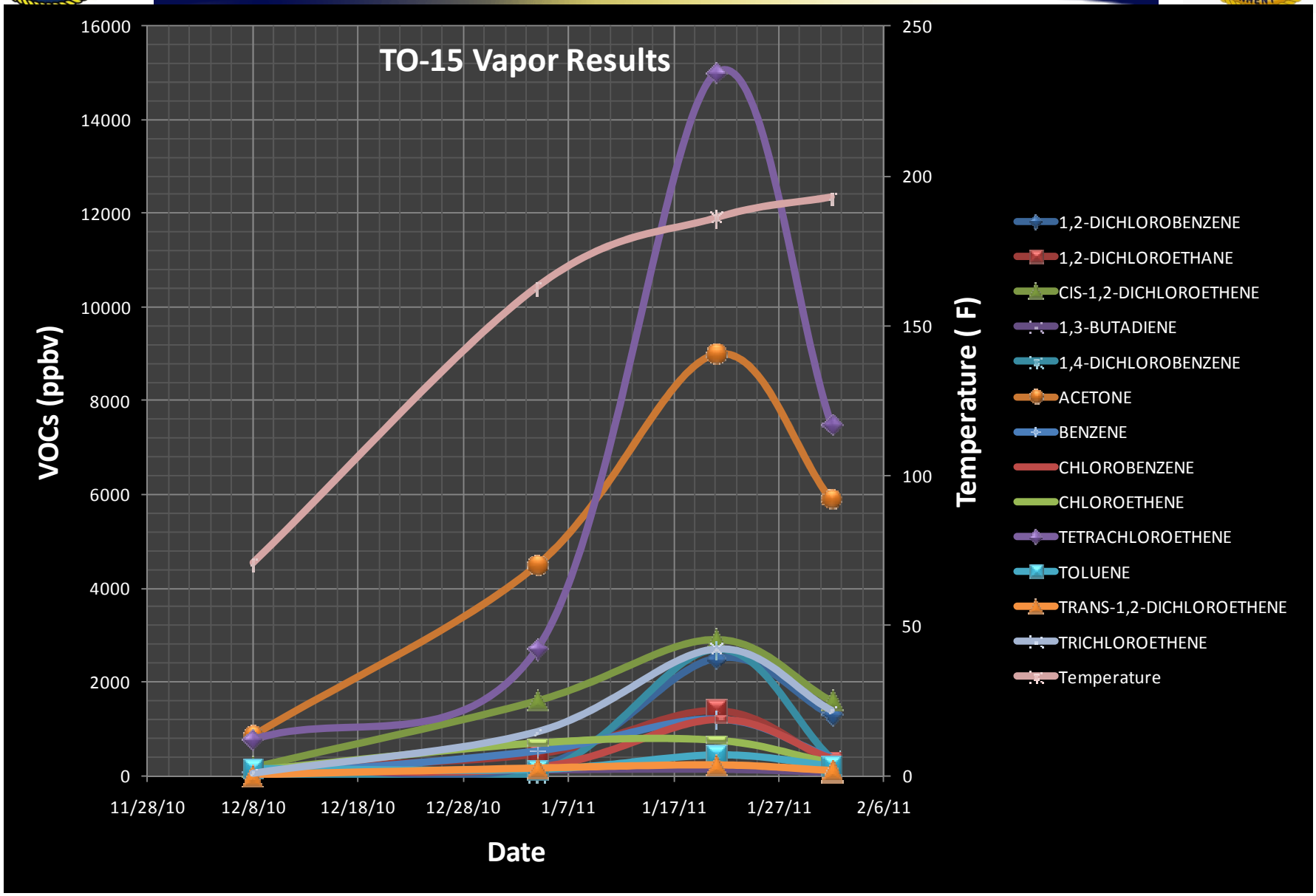
Mass Removal



TWM2 Update

Tamzen Macbeth, 2/16/2011

TO-15 Result for CoCs and other VOCs



Conclusions

- Heating progressing, as planned, current temperatures at/near target treatment temperature (current average is 209F).
- Have pneumatic control as indicated by zero and sub-zero pressures at PMP-1 compared to PMP-2.
- PMP-3 was tempora TWM1 a positive pressure (0.3" w.c. for two days) but extraction rate is in the order of 300 scfm (steam plus non condensable vapor). The pore volume at the site is exchanged somewhere between 70-80 times a day.
- Removed ~350 lbs of VOC mass based on PID readings.
- Continue operation of the heating system is planned through March 8.

Slide 16

TWM1 update this #
Tamzen Macbeth, 2/16/2011

Upcoming Events Schedule

- SAP Addendum- BCT over the shoulder review week of Mar. 7, 2011 and Web Ex. Mar. 9, 2011 to resolve comments and get concurrence

- TC3 Install temporary injection points Mar. 14-17, 2011
- TC3 injection Mar. 21-25, 2011
- TC3 Groundwater Monitoring Event 5 (IR25MW68A, and -11A) Apr. 20, 2011
- TC2 Groundwater Monitoring Event 2: February 22, 2011.

- TC2 decision point: Shutdown, Mar. 7 or 8 on Webex
- TC2 Cooldown: Mar. 9-23, 2011 SVE system on.
- TC2 and 3 Post –treatment groundwater, soil gas and soil data collection: May. 16-20, 2011
- TC2 System Demobilization- May 2011